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ABSTRACT

The exploitation of human and physical resources in the 1950s and 1960s to maximize economic and technological expansion has brought about an enhanced awareness of their negative consequences and of the importance of the environment on human well-being. This study focuses on the need for an assessment of an individual's capacity for living in various environmental settings. Three simulated social models illustrating the relationship between an individual and an environment were prepared in a slide series. The three models were: (1) a behavior model, focusing on behavior modification; (2) a humanistic model, focusing on the importance of nature and human dignity; and (3) a growth model, emphasizing steering and control in continous growth. The Swedish model, representing the Swedish way of creating a quality of life was included for comparison. The models were shown to 214 inservice teachers and 57 high school pupils who were asked to assess the possibilities and constraints on life in each social model. Each simulated environment was evaluated for its physical existence, security, freedom of action, efficacy, and adaptability. Results showed that the growth and behavior models were viewed favorably. Contrary to expressed preferences toward humanistic values discriminant analysis indicated that the growth model was conceived as the best way to secure quality of life. (JAZ)

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Perception of Quality of Life

Bernhard Bierschenk

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Perception of Quality of Life

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Abstract

Development into a high technology society implies both the enjoyment of tangible benefits and the discomfort of rising costs as regards the ecological pollution and the degradation of the quality of life. This brings forth the need for an assessment of the consequences for every-day life. This article focusses on the need for an assessment of one's own possibility to live in various feasible environmental settings. These have been projected by means of a Behaviour model, a Humanist model, and a Growth model. The Swedish model was also included as a possible point of reference. Subjects were 214 inservice teachers and 57 high school pupils. The result shows that the quality of life as defined by the Growth model is strongly preferred by both groups.

Perception of Quality of Life

The 50's and 60's were characterized by an unrestricted exploitation of resources, both human and physical, with the purpose of maximizing economical and technological expansion. Various research groups around the world were worried by the consequences, which started lots of attempts to extrapolate the ongoing trends. The model the most well-known and discussed was the one developed by Forester (1971) and Meadows et al. (1972) at Massachusetts Institute of Technology. One political consequence of the enhanced awareness of the negative effects resulted from actions taken by particular persons and institutions was the constitution of the Club of Rome, which aimed at getting the negative effects of technolgocial expansion under control. At the same time, the perception of the import of the environment on human well-being increased. More and more ecologically oriented studies were published, which contributed to a cumulated ecological consciousness (Boulding, 1985, a, b; Cantril, 1965).

From this development, the concept of quality of life grows up. As for Sweden, the attention was primarily concentrated on the idea about the security of the People's Home, which should be guaranteed by a "strong society" represented by a mighty public sector. This is a society that institutionalizes every kind of activity and makes decisions for the subjects in matters of decisive importance. This basic view has also determined the development of the 80's. The central function of the well-fare society to create social and economic security has led to an expanding public sector in which the legal rights of the individual becomes more and more restricted, judging from the public debate going on.

The Swedish way of creating a quality of life has become internationally known under the name of "the Swedish model". From an international perspective, the model has been met with praise but also with criticism, as for example in connection with the law giving the community the rights to take over the guardianship of children. The questions to be studied in the following are: (1) How do Swedish teachers perceive the quality of life in Sweden? This group, namely, has the authority of bringing about the values of the society to younger generations. But it is just as important to get to know (2) whether the young generation of today has adopted the Swedish

model. Therefore, also a group of students on the high school level is studied, which is just about to leave school and enter the social life as grown ups.

In Western societies, there are various kinds of components built in, which are more or less closely connected to basic concepts of science, such as steering and control, evolution, and behaviour modification. A symposium with the title "The ways of mankind - Exploring human sciences" was arranged in 1972 by the King Screen Productions, Seattle, California. The aim of the symposium was to discuss and analyse what importance the basic concepts of science have and may have for the development of a society. As a result of the symposium, three concepts have been the foundation of the construction of three social models, which have been visualized both in the form of a slide series and in the form of a motion picture. One scenario illustrates a social system which may be a result of the application of the concept of behaviour modification. The program shows the modes in which the concept could be implemented with the purpose of designing a society. The scene opens up with a young man being rescued from undernourishment and who has amnesia. The program continues in mediating the functioning of the social system in its efforts to rehabilitate the rescued person and to integrate him into the society. The program builds on the design described in Skinner's "Walden Two". The second scenario gives a picture of a community in which nature and human dignity are of highest value. The community has access to a sophisticated technology, which is used with care and in accordance with "sound" ecological practice (The program quide to "Projections for the Future", 1976). The program is concentrated on a young man who gets to know himself and his environment. The foundation of this scenario is the concept of evolution, which denotes both a physical and a mental evolution. The third scenario is based on steering and control. The program describes a society in continuous growth with respect to the population as well as to the technology. In the opening scene, a young man is presented together with his wife. The functioning of the control mechanisms and a continuous growth are illustrated in that things happen to the man on his way to a city, as for example what the consequences are when some control mechanisms are out of order. The theme of this program is the use of park space and the way in which the concept of recreation has changed.

These three scenarios constitute the main components of the study. The task presented to the subject groups was to enter into and to integrate one's experience into each scenario, and then to assess the possibilities and constraints on life in the society in question.

Method

Subjects

The subjects were groups of inservice special subject and remedial teachers at Malmö School of Education, Lund University in 1981. Moreover, some groups of pupils from one of the high schools of the city of Malmö participated. The pupils came from grade 3 (= final). All together 286 persons were tested during the months of March and April 1981 in the form of group testings. 85 out of 88 special subject teachers handed in completely filled test forms, 129 out of 139 remedial teachers, and 57 out of 59 pupils. The mean internal non-response is 5 %. After the analysis of the non-response, the subjects were divided into the following categories: (1) male remedial teachers (n = 37), (2) male special subject teachers (n = 36), (3) female remedial teachers (n = 92), (4) female special subject teachers (n = 49), (5) male high school pupils (n = 21), and (6) female high school pupils (n = 36).

Material

An audio-visual material ("Projections for the Future", commercially produced in 1978 by the Biological Sciences Curriculum Study, P.O. Box 930, Boulder, Colorado 80302) constitutes the context of the assessments of "quality of life". The material used contains three different coloured slide series representing the extrapolation of trends and tendencies in the US society of today. The basic idea of experimenting with these series is that an interpretation of human actions cannot take place independent of an effort to build in theories of behaviour into these models of societies. Every single series tries to model some concepts founded on the following three basic paradigms: (1) Association, (2) Structure, and (3) Process. As a first measure, the audio-visual material, therefore, was assessed by a panel of five behavioural scientists in order to find out which paradigm governs

which model. The paradigmatic characteristics that the assessors were to assess on a nine point scale with the end points "does not emerge at all" (1) and "emerges clearly" (9) have been published in Bierschenk (1978).

The associations between the models and the factorized scales are shown in Table 1. The estimated proportions of predicted variance are reflected by the effect size index ($\hat{\omega}^2$).

Table 1.
Estimated effect size

		Paradigm		
Model		**A**	**S**	**P**
Behavior	1	.49	.39	.16
Humanist	2	.42	.63	.30
Growth	3	.77	.00	.00

A = Association
S = Structure
P = Process

As can be read from Table 1, the first model shows a high correlation with the paradigm of Association. This is in agreement with the model builders' ambition to incorporate concepts such as reinforcement and reward into the scenario. The second model correlates even higher with the paradigm of Structure. Here the ambition was to focus on intellectual behaviour, which is to be interpreted as a result of biological processes and an experience of insight, which occurs through a new structuring of the individual's visual field. The third model was expected to correlate primarily with the process paradigm, which means that steering and control would be perceived as basic concepts. The basic factor in the interpretation of behaviour, therefore, should be a cooperative relation between individual and environment. As is evident in Table 1, this aim was not fulfilled. Instead, basic concepts pertaining exclusively to SR-theoretical statements seem to have governed the construction of this model. The Growth model seems to be the only one that pertains solely to one paradigm. The Humanist model contains also to a substantial degree

paradigmatic information pertaining to the paradigms of Association and Process. The same holds for the Behaviour model.

The entire material consists of three components within each model sequence. The first component illustrates the principles behind the construction of the model, the second contains a "discussion" of the consequences by the application of the principles, the third constitutes the action component, which presents the consequences in the form of a narrative.

Instrument

The purpose of constructing a measuring instrument has been to get a conception of the way in which various possible conditions in the future may influence the assessment of particular individuals on how they will be able to live and work in each one of the simulated environments. An objective assessment of what persons observe in their environment requires some orientational system. The components of the system being the basis of the construction of this measuring instrument are the following.

1. **Physical Existence**

   The assessment concerns economical constraints and those constraints referring to the housekeeping of energy and information exchange. The operationalization concerns (1) food, (2) living, and (3) clothing.

2. **Security**

   The assessment concerns the probability that the economical system continues to supply products and the financial means for their acquirement. Moreover, the assessment concerns the continued striving of the government to create regulated and stable environments and to see to it that the laws are obeyed, and also that health care continues to function well. The operationalization concerns (1) physical health, (2) mental health, and (3) prosperity.

3. **Freedom of Action**

   The assessment requires an understanding of the state of the environment with respect to the conditions of living, the existing laws and values. The operationalization concerns (1) physical and mental vitality, (2) freedom of choice, and (3) participation.

4. **Efficacy**

The assessment concerns the personal ability to have influence on one's environment. This may be done partly to assure oneself of an adequate access to resources, partly to avoid danger and to obtain affluent conditions. The operationalization concerns (1) possession of adequate resources, (2) shared responsibility, and (3) economic investments.

5. **Adaptability**

The assessment concerns the personal ability to make such decisions that make possible an adjustment to basic alterations in the environment. This ability is referred primarily to a change of the self-conception. The operationalization concerns (1) justice, (2) legal rights, and (3) social security.

Operationalization

The basic components of the orientational system specified would be capable of direct operation, provided that the alterations in a given environment are suffciently radical. However, to normal conditions they are too general in their formulations, which implies the demand for a reformulation to more specific statements. These shall reflect certain particular circumstances the way they exist at a given place and point in time. The information about what different persons wish and may accept now and in the future have given rise to 51 statements of which the following 20 have shown enough discriminating power for being presented.

1. **Physical Existence**
   - 6. I can get myself a suitable place to live whenever I want to
   - 11. I have access to a varied supply of clothes
   - 50. I have an absolute right to information

2. **Security**
   - 7. I can develop according to my own qualifications
   - 17. I can live a well-arranged life
   - 22. I can get the education that suits me the best
   - 30. I have access to all the help I need
   - 34. I can profess to the religion I want
   - 41. I can express myself freely

3. **Freedom of Action**
   - 3. I can actively contribute to revaluations in the society
   - 8. I can buy all kinds of clothes
   - 23. I can without prevention get me the information I need
   - 44. My actions have a great influence on the well-being of others
   - 45. That I keep my promises is appreciated by others
   - 47. That I take personal initiatives is appreciated

4. **Efficacy**
   - 9. I have an influence on the industry by my membership in a collective
   - 19. I can participate in social planning
   - 24. I can work for the design of functional housing areas
   - 28. I can influence the utilization of the natural milieu

5. **Adaptability**
   - 15. I have the right to live in accordance with my own values.

The I-reference in these statements shall give room for an assessment that is in accordance with the value system of the subject. For the choice of an assessment dimension, there are several alternatives: assessment of (1) probability, (2) necessity, or (3) certainty.

Scaling. A person does not only act but tries to judge and understand his actions. In this process, an individual can be very certain with respect to the concepts on which the reasoning is based. But more common is a relative uncertainty. This subjective certainty differs in all essentials from the objective probability. Apart from this fact, it is the subjective certainty that influences thinking and decision making. The 51 statements were presented in random order. They were assessed on a scale with 9 steps. The indications from 1 to 10 denote the degree of certainty in the judgment of the validity of each single item in relation to the model that the assessments concerned.

Instruction. Now you have seen the slide series and have entered into this society. You will now assess a number of statements about how your life is. You will do that by indicating how certain or uncertain you think that every statement is. If you are "very uncertain", you indicate 1. If you are "very certain", you indicate 10. It is natural that the degree of

certainty varies, so don't be afraid of using the whole scale. Work rapidly, but don't leave out anything.

Design and Procedure

The testing was carried out in four sessions. Each meeting took about 40 minutes. During the first meeting, the models were shown to subject teachers in the order (2) the Humanist model, (1) the Behaviour model, and (3) the Growth model for teachers of arts. Teachers of social science subjects were presented the models in the following sequence: (1) The Behaviour model, (2) the Humanist model, and (3) the Growth model. Teachers of natural science subjects first saw (3) the Growth model, then (1) the Behaviour model, and finally (2) the Humanist model. The reason for the alternative sequencing was to evoque a positive attitude to the material. The Humanist model builds on a humanistic view and underlines the importance of knowledge before technology. The main theme of the Behaviour model is influenceability and behaviour modification through reinforcement and reward. The Growth model stresses the importance of natural selection, steering and control, and the need for balance. In this first meeting, 85 subjects participated.

In the second and third testing sessions, the models were shown to all teachers registered in the remedial inservice training in 1981. At the second meeting, three groups were tested. The first group saw the sequence (2 1 3), the second saw the sequence (1 2 3), and the third saw the sequence (3 1 2). The same pattern was repeated during the third meeting. Alltogether, 129 subjects participated.

In the fourth testing session, the pupils participated. They saw the models in accordance with the sequencing of the first meeting. The pupils tested were 57.

Each subject had to open an envelope containing numbered test forms. The first form (No. 1) should always be filled in with the Swedish society as a "model". This had two aims, namely to acquaint the subjects with the contents of the forms, and to create a basic comparison for the assessments of the models. After the filling in of the first form, the first model was shown in accordance with the sequences described. The respective form was filled in with this model as a background. After the last model,

all the forms were put into the envelope again, which was sticked down. The filling in of the forms took place anonymously.

The showing took place in a class room particularly prepared for audio-visual presentations. Two slide projectors, manoevred by sound impulses from a cassette recorder, were used for the exposure. The American slide series were altered in such a way that only the action oriented component of each model was shown with a Swedish translation. The showing and testing took place at the same occation and in the same room.

Results

A factor analytic evaluation of the measuring instrument shows that the factor structure matrix does not contain five but three factors, provided that Kaiser's criterion ($\lambda > 1$) is used for a determination. The following three factorized scales were constructed.

1. **Adaptability - Security**
   7, 15, 34, 41, 45, 47, 50
2. **Freedom of Action**
   3, 9, 19, 24, 28, 44
3. **Physcial Existence**
   6, 8, 11, 17, 22, 23, 30

A reliability estimation of the scales showed for the first factor α_{max} = .78, for the second factor α_{max} = .56 and for the third factor α_{max} = .34. These three factorized scales were constructed as potential predictors.

Assessment of Models

An analysis of the assessments that six different groups have made of four different environments in three dimensions requires a multivariate strategy of analysis. The first step was the analysis of the 4 x 6 design with Cooley & Lohnes (1971, pp 238-241) MANOVA program presented in Table 2.

Table 2.
4 x 6 design

Model	Group	1	2	3	4	5	6
Behavior	1	1	2	3	4	5	6
Humanist	2	7	8	9	10	11	12
Growth	3	13	14	15	16	17	18
Sweden	4	19	20	21	22	23	23

1 Male remedial teachers
2 Male subject teachers
3 Female remedial teachers
4 Female subject teachers
5 Male high school pupils
6 Female high school pupils

The number of subjects with complete test vectors in the smallest cell of the design turned out to be (n = 20). The other 23 cells in the design (Tab. 2) were balanced through random selection so that all cells contained (n = 20), i.e. 20 replications per cell. MANOVA was carried out for N = 480 measuring objects.

The first question to be studied with a multivariate generalization of the analysis of variance is whether group differences exist with respect to the localization of the groups in the multidimensional measuring space specified by the three factorized scales. The hypothesis may be formulated

H_1:The population has a common dispersion Δ , i.e. the dispersion matrices of the groups do not differ from each other.

The characteristic feature of a MANOVA design is that its dependent variable is a vector. This test vector is assumed to be multivariate normal distributed with the same dispersion or variance - covariance matrix for every population.

The central research question, however, is whether there are real differences between the centroids of the models. This question will get its answer by the test of the hypothesis.

H_2: The test vectors discriminate between the models.

The measuring of the way in which the models are localized in the measuring space requires a factorial discriminant analysis. The MANOVA analysis was carried out with the purpose of generating the data to be read in by FACDIS (Cooley & Lohnes, 1971, pp 316-322) to form the three hypothesis matrices needed in the factorial discriminant analysis. The result is shown in Table 3.

Table 3.
Factorial discriminant analysis for 3 factorized scales, 24 groups and 20 replications.

Effect	Λ	df_1	df_2	F	η^2
Models	.33	9	1153	73.74	.67
Groups	.91	15	1302	2.86	.09
Covariation	.88	45	1373	1.38	.12

Note. Groups and covariation effects are nonsignificant.

The first hypothesis, which is critical for the multivariate theory, concerns the covariance effects between the rows and columns presented in Table 2. As is shown in Table 3, there is no noticeable covariance, which is denoted with Wilk's lambda (Λ). By this circumstance, the interpretation of the remaining analysis result becomes much easier.

The continuing discussion of the analysis results is exclusively based on "effect size" (Cohen, 1969), denoted with the generalized eta squared (η^2). This coefficient is a function of lambda. That no covariance exists implies that the discriminant functions for group and model effects behave orthogonally to each other.

The negligible effect for groups simplifies the presentation of the analysis results even more, at the same time as it underlines the overwhelming effect in the discrimination between the models. The simplification means that only the correlation of the factorized scales with the

discriminant functions for the model effect needs to be presented. The structure coefficients are given in Table 4.

Table 4.

Factor structure for three discriminant functions.

Discriminant functions		1	2	3
Adaptability-Security	1	.93	-.36	.09
Freedom of Action-Efficacy	2	.87	.40	.31
Physical Existence	3	.54	-.42	.73
% extracted variance		63.52	15.60	21.34
R_C^2		.55	.27	.005

The structure coefficients show that the three scales correlate high with the first discriminant function. It takes up about 64 % of the variance in the scales. Moreover, the squared canonical correlation shows that 55 % of the explainable variance refers to the first function. The second function takes up about 16 % of the variance in the scale, whereas 27 % of the explainable variance may be referred to the second function. The third function takes up 20 % of the variance in the scales but only 0.5 % of the explainable variance. Since the discriminant functions behave orthogonally to each other, the discriminant values are uncorrelated values. However, for a separation of the models in the discriminant space, only the first and second functions are of importance with the stress on the first dimension.

The first discriminant function is very highly loaded with both Adaptability - Security and Freedom of Action - Efficacy. The second discriminant function shows partly a considerably lower and negative loading for the first factor, partly a weekly positive loading for the second. The factor Physical Existence is positively correlated with the first discriminant function and negatively with the second. What the first discriminant function seems to represent is Affluence. The negative coefficients of the second function seem to point at Indigence.

In Figure 1 is illustrated the localization of the centroids of the models in the two-dimensional space described. Figure 1 shows a clear separation between the models. The first dimension, Affluence, separates

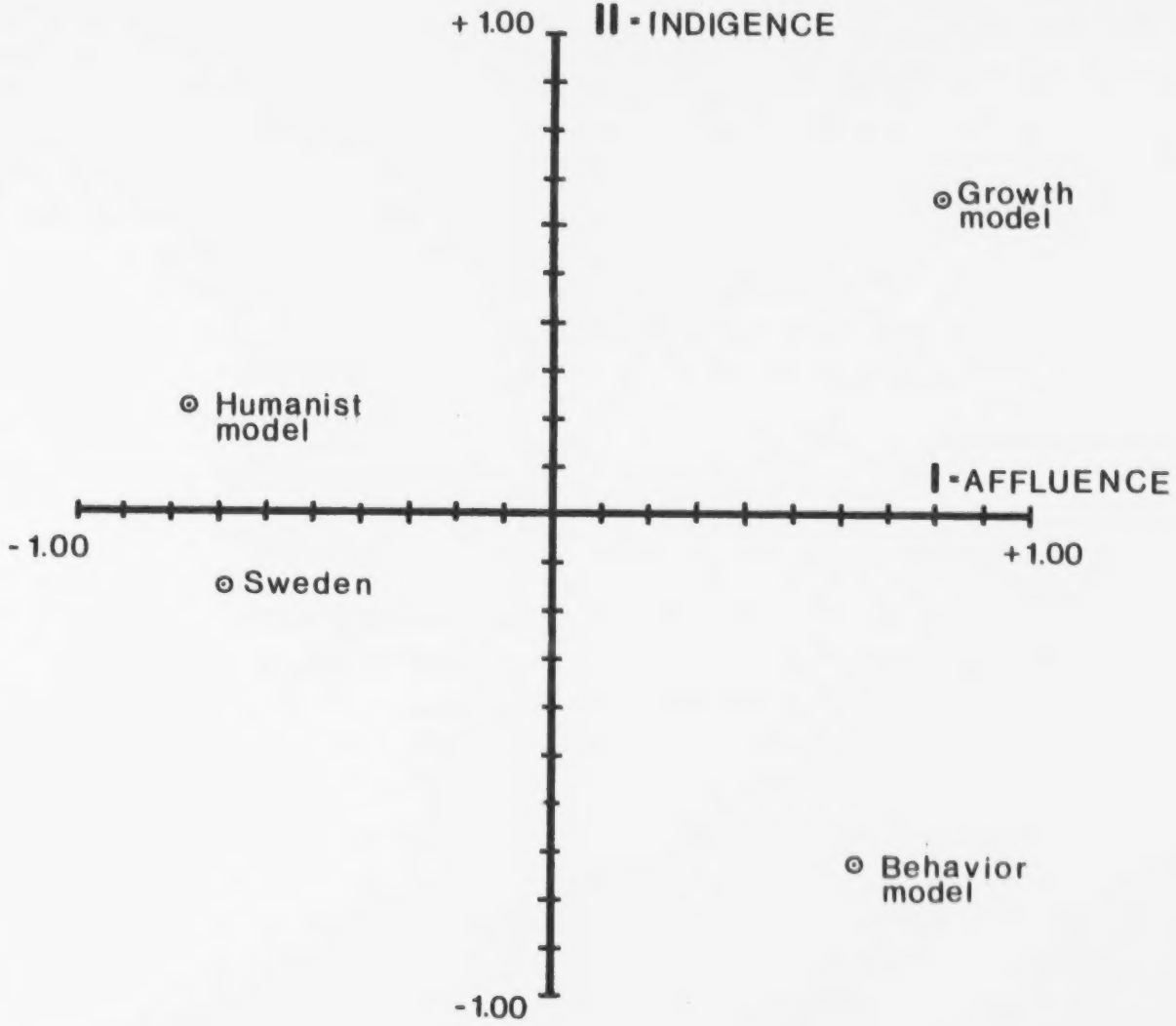

Figure 1. Discriminant functions (I, II) and their standardized coefficients.

the Growth and Behaviour models from the Humanist and Swedish models. The first two show high negative weights. The second dimension, Indigence, is needed to differentiate between on one hand the Growth and Behaviour models, and between the Humanist and Swedish models on the other. The Growth model shows a high positive weight on the second dimension, which means that it is conceived as less indigent than the Behaviour model, which shows a high negative weight on this dimension. The same relationship although less profiled is present between the Humanist model and Sweden. In that Sweden has been placed in the lower left square it represents a bottom position with respect to Affluence and Indigence.

Discussion

The program guide to the "Projections for the Future" (1976) presents the three models in the following frames of reference. The Behaviour model poses the central question on what would happen to a member of the society if he deviates from the values of the collective. The story takes place within a grey-white hospital milieu. That this model is not the preferred one by the producers is clearly expressed by this range of colours. The Humanist model represents a society where people care about each other. This description of a social mentality together with rich colours and scenic views transmits a preference, contrary to the wishes of the producers to keep the presentations neutral. The third model, whose description forms the opposite pole of the Humanist model, describes how bad the technological development may be. If we should continue the way we do, the society will be filled with beggers, bureaucratic regulations and all kinds of restrictions of freedom, absurdly high taxes, inflation, cheating and corruption, frequent break-downs of sophisticated control systems, power failures, poverty, criminality and increased violence mentality. The description of the Growth model is underlined by the red-orange range of colours, reminding of warning lights.

Some comments to the production have been given by Swedish teacher educators. These are quoted here.

Behaviour model. "After having seen the whole picture sequence one is totally aware that 'we don't want such a society' and this I suppose is also the opinion of the program producers." "The producers explicitly show their

attitude towards behaviourism." "The application on the society made clear some typical features, for example positive reinforcement."

Humanist model. "The beginning is difficult to understand /.../ This seems to be a better society, and the pupils are being steered. They may even be manipulated with a behaviouristic technique." "A big difference in contents compared with the first model (Behaviour) with the point of view that here it is about energy supply, ecological balance, whereas in the behaviouristic model one only took up how a person is integrated into a system. The whole presentation is more positive, which may be interpreted such that the producers have their standpoint and do not present the models objectively."

Growth model. "The material hardly touches upon problems of natural science character. This describes fairly well the society of today." "The model does not at all take up e.g., energy problems but judging from the illustration a highly industrialized society was thought of, which then really has to discuss the growth problems. As a matter of fact, it describes the situation in a big city today. Does hardly mention collapses due to energy, population, the gap between i-(industrial) and d-(developing) countries. The material gives very little from a natural science point of view."

With the background of the perceived intentions of the producers and the comments from teacher educators it can be said, however, that any group differences between teachers and pupils do not exist as regards the perception of the models. Thus no value judgment about the "good-ness or "bad-ness" (The program guide) of the models shown seems to have influenced the subjects in this study.

The overall importance of the model differences, as represented by the way the centroids are localized in the discriminant space, point towards unexpected differences with respect to the quality of life. The two models which are conceived as prosperous, and as such favourable, are the Growth and Behaviour models. From the point of view of Indigence, the Behaviour model is negatively assessed, while the Growth model obviously represents all the desired properties. Thus the model the least favoured, according to the preferential judgments of teacher educators, has the most positive loadings and is localized diametrically to the society from which the subjects have their experience.

The commonly expressed attitudes by Swedes and Swedish officials towards the Swedish model may make one believe that Sweden is "a good country to live in". Contrary to this belief, the loadings point towards a model representing poorness and indigence. The same holds true for the Humanist model, which means that a model founded on non-materialistic principles is assessed to be a poor place to live in, although somewhat less indigent than Sweden.

How come that the non-materialistic models are unfavourably assessed? Is this result a consequence of a revaluation of the discussion and criticism of the Swedish well-fare model that took place during the 60's and 70's? Contrary to what one would expect from the preferences expressed towards humanistic values, this study indicates that the Growth model is conceived as the only way to secure quality of life.

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